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Unusual case of cutaneous squamous cell carcinoma in an ewe

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Abstract

Squamous cell carcinoma (SCC) is a malignant tumor of epidermal cells in which the cells show differentiation to keratinocytes and is common in the horses, cattle, cats and dogs but is uncommon in the sheep. This communication describes a case of cutaneous squamous cell carcinoma (SCC) in a 5-year-old ewe. The tumor mass located on lumbar back and histological evaluation of biopsy sample revealed features of active SCC including atypical squamous cells with pleomorphism and hyperchromatism and atypical mitotic figures with dyskeratotic cells.

Keywords: squamous cell carcinoma, sheep, cutaneous mass, pigmentation

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Introduction

Squamous cell carcinoma (SCC) is a malignant tumor of epidermal cells in which the cells show differentiation to keratinocytes (Goldschmidt and Hendrick, 2002). Although the etiology of SCC is not clear in all cases, there are several factors that are associated with the development of a SCC, including prolonged exposure to ultraviolet light, lack of pigment within the epidermis at the site of tumor development, and lake of hair or very sparse hair coat at the affected sites (Goldschmidt and Hendrick, 2002, Scott, 1988). Although papillomavirus virions have been observed in a hyperkeratotic lesion in a ewe (*Vanselow* and *Spradbrow, 1983*), but direct association between papillomavirus and SCC has not been demonstrated in sheep (Swan *et al*., 1984; Mendez *et al*., 1997).

SCC is common in the horses, cattle, cats and dogs, relatively uncommon in the sheep, and rare in the goats and swine (Goldschmidt and Hendrick, 2002).

Case description

In May 2010, a 5-year-old Khorasan-Kordi bred ewe was examined for a large cutaneous mass on the lumbar back which observed as a nodule and grew slowly and deformed over a period of 5 months. The lesion failed to respond to topical treatments with a number of disinfectants and antibiotics. The ewe belonged to a flock of 250 sheep and there was no history of similar lesion in the flock.

On clinical examination, the ewe was thin (body condition score 2.5 of 5). The tissue mass was proliferative with size of 7 × 12cm and irregular surface. Some area of the mass was covered by scab and there was evidence of suppuration and tissue necrosis. The lesion was located on lumbar back at vicinity of lumbar vertebrate 1-3 (Fig 1). There was no evidence of another cataneous lesion or of metastasis to other organs. The peripheral lymph nodes were normal. A biopsy sample was taken, fixed in 10% buffered formalin and processed for routine histopathology. The sections were stained with Hematoxylin and eosin stains.

Histopathological examination revealed irregular masses and elongate cords of tumor cells extended haphazardly downward into the dermis. Individual tumor masses composed of varying proportion of normal and atypical squamous cells showing pleomorphism and hyperchromatism. There were frequent atypical mitotic figures with dyskeratotic cells. There were also many rounded nest of squamous epithelium in which the cells were arranged in concentric circles surrounding a central focus of acellular keratin consistent with keratin pearl. Nuclei often contained multiple prominent nucleoli (Fig 2). Other lesions included necrosis, hemorrhage and ulcer formation with secondary infection.

Based on histological characteristics the tumor was diagnosed as SCC.

Discussion

This case of SCC was unusual in terms of location of the tumor on the back and the season of tumor development and growth. In sheep, SCC occurs in adult to aged animals and is seldom seen in animals less than 4 years of age, with maximum rate in 12-year-old sheep (Ladds and Entwistle, 1977). Although early studies indicated a greater incidence of SCC in female sheep, subsequent work has not confirmed the relationship of sex to occurrence of SCC (Ladds and Entwistle, 1977; Ladds and Daniels, 1982).

The lesions may be solitary or multiple and are commonly seen in locations which are poorly pigmented and not protected from solar radiation including eyelids, muzzle, lips, pinnae and perineal region (Swan *et al*., 1984; Mendez *et al*., 1997; Del Fava, 2001). Although no causal factors were completely determined for SCC, the location of the tumor in skin with little or no pigmentation and unprotected by wool, together with the higher prevalence observed in adult and aged sheep and seasonal nature of the lesions suggest that the major causative factor is prolonged exposure to the ultraviolet radiation

from sunlight, as it is observed for ocular SCC in cattle (Goldschmidt and Hendrick, 2002; Divers and Peek, 2007). On the other hand, because the effect of ultraviolet radiation is cumulative, the SCC is mainly observed in adult and old sheep (Daniels and Johnson, 1987).



Figure 1. Large mass of squamous cell carcinoma with superficial ulcer formation and suppuration involving the skin of lumbar back.

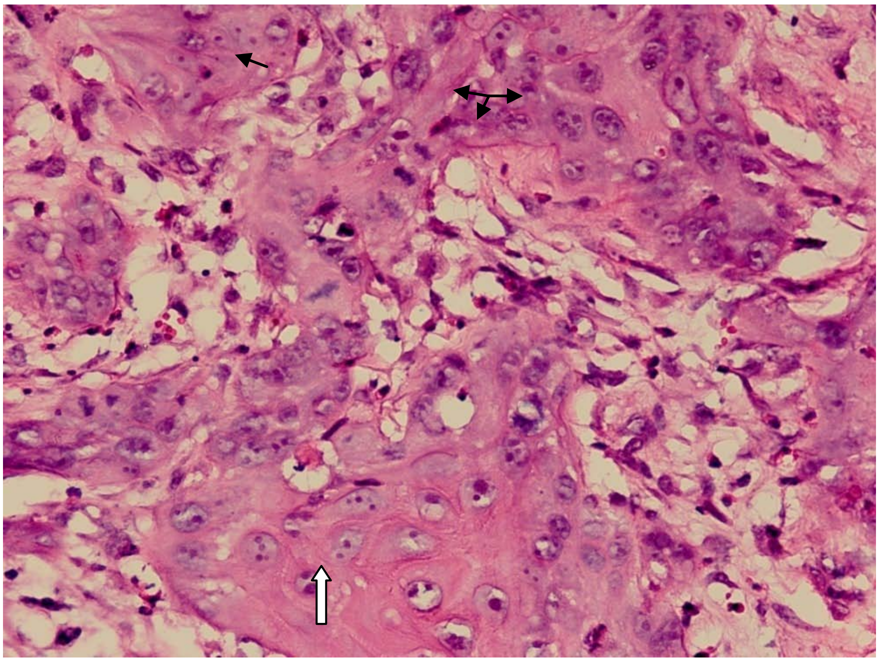


Figure 2. Tumor cells showing hyperchromatism (white arrow), pleomorphism (black arrows) with prominent nucleoli and atypical mitotic figures. There are also dyskeratotic cells and keratin pearl. Hematoxylin and eosin. × 400

Genetic factors are among the factors which predispose sheep to SCC. This type of cancer has frequently been associated with Merino sheep, or with breeds to whose bloodlines the Merino has contributed significantly. The particular susceptibility of Merino sheep and derived breeds to SCC would appear to be linked to their lack of skin pigmentation (Lioyd, 1961; Daniels and Johnson, 1987). In cattle, it has been shown that the genetic factors effects on the pigmentation of the eyelids and corneosclera determine their degree of susceptibility (Gilger *et al*., 1991; Anderson, 1991). On the other hand, hereditary factors also effects on SCC occurrence. Therefore, in addition to breed differences, individual differences in susceptibility to SCC independent of the effect of ocular pigmentation exist in some strains of cattle which are inherently resistant to SCC (Gilger *et al*., 1991).

Occurrence of perineal and vulvar SCC has been reported after radical Mules' operation of tail docking, which is done to minimize susceptibility to fly-strike, and unproper time of shearing (Swan et al., 1984). Access of sheep to photosensitizing agents in the pasture appears to increase occurrence of the SCC (Lioyd, 1961).

Although the incidence rate and economical importance of SCC in sheep has not been determined in Iran, however, early detection and improvement of genetic factors which determine the rate of skin pigmentation as well as some management practices may decrease the incidence rate and losses of SCC.

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گزارش یک مورد غیر معمول تومور پوستی سلول های سنگفرشی در میش

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چکیده

این گزارش رخداد یک مورد غیر معمول تومور سلول های سنگفرشی را در یک راس میش ۵ ساله توصیف می کند. در این مورد توده توموری در ناحیه پشتی – کمری دام واقع شده بود و ارزیابی بافت شناسی نمونه بیوپسی از آن چهره تومور فعال سلول های سنگفرشی شامل سلول های غیرتیپیک سنگفرشی همراه با پلئومورفیسم ، هیپرکروماتیسم ، میتوز غیر تیپیک و سلول های دیسکراتوتیک را نشان داد.

واژگان کلیدی: تومور سلول های سنگفرشی، گوسفند، توده پوستی، پیگمنتاسیون